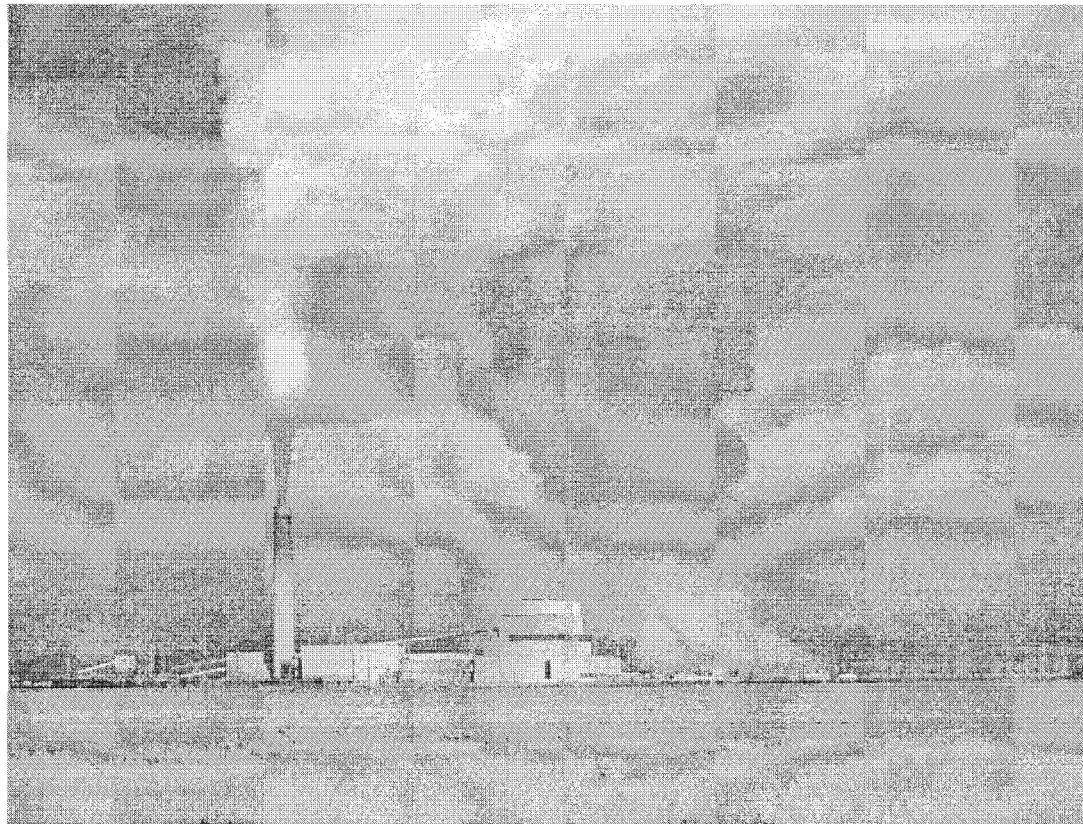


# **Supervisor Leadership Training Engineering Projects 2006**



**Presented February 2006  
By Jerry Hintze**

# Fun With Math

There is only one number for which the following is true:

$$x^2 = x + 1$$

$$1/x = x - 1$$

Hint: It is referred to as the golden mean, golden rectangle or golden ratio. Second most recurring number in nature to Pi. Number is widely used in Architecture

# OUTLINE

- Major Projects (over \$100k)
- Non-Capital Projects
-

# **Major Projects**

- **DCS Replacement**
- **ID Fan Drive Replacement**
- **Generator Excitation Replacement**
- **Circulating Water Line Repair**
- **Essential Service Battery Chargers**
- **HP Heater Alternate Drain Valves**
- **Reverse Osmosis Unit**
- **Burner Line Balancing Equipment**
- **Sludge Conditioning Dust Control**
- **Fire System Pressure Maintenance**
- **Replace Surface Water Supply System**

# MAJOR PROJECTS

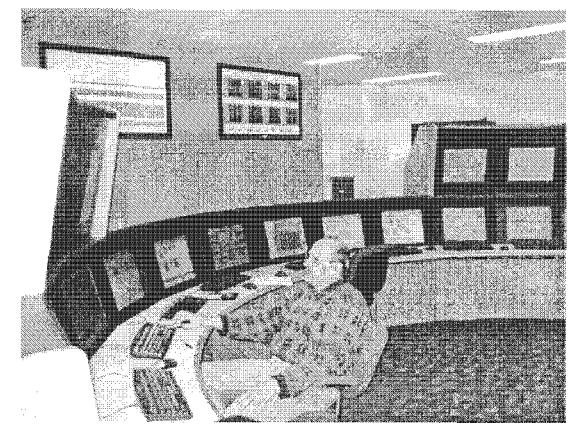
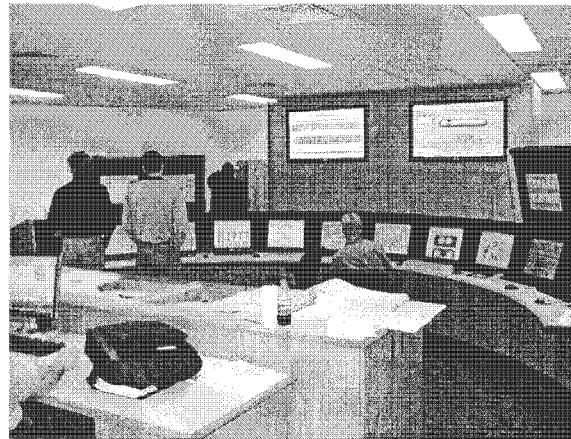
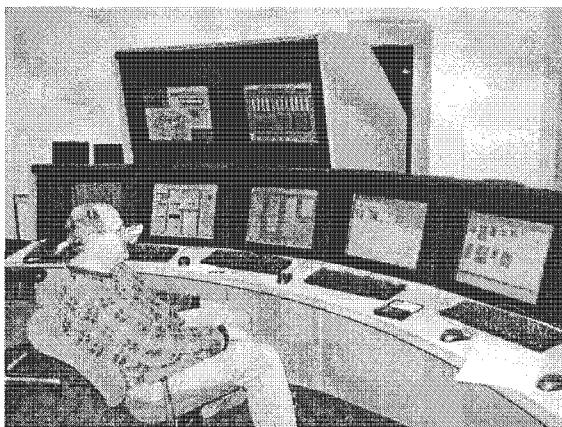
## DCS Upgrade (ABB) & Simulator

### DCS Upgrade:

- Phase 1- replacement of U2 FOX 1A DAS & SOE, scheduled 03/2004 **completed**
- Phase 2- replacement of U1 FOX 1A DAS & SOE, scheduled 03/2005 **completed**
- Phase 3- replacement U2 Turb, Boiler Comb & CPL controls scheduled 04/2006
- Phase 4- replacement U1 Turb, Boiler Comb & CPL controls scheduled 04/2007

### Simulator:

- Phase 1- Model Acceptance, **completed**
- Phase 2- Factory Acceptance Testing, **completed**
- Phase 3- Commissioning of the Simulator scheduled for 04/2005, **completed**
- Phase 4- Console/command station received 11/2004 **completed**



# MAJOR PROJECTS

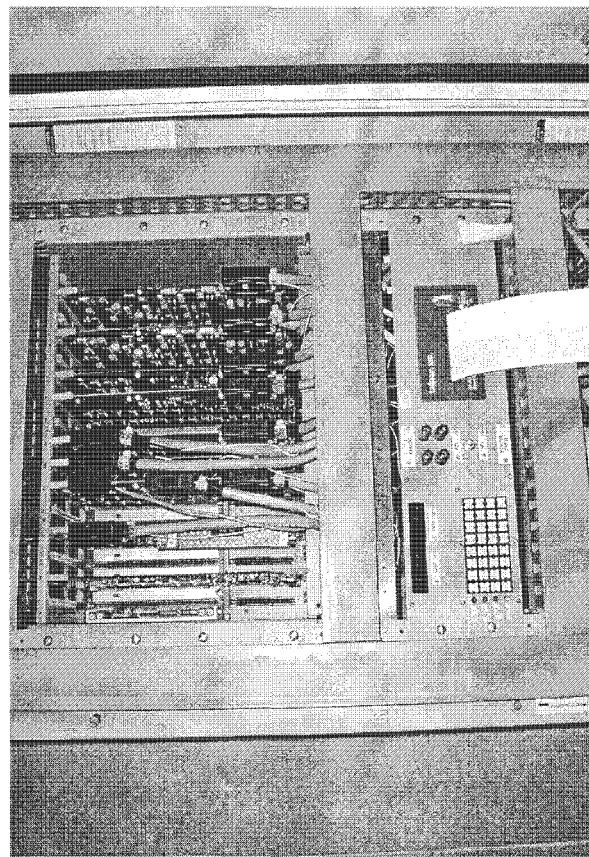
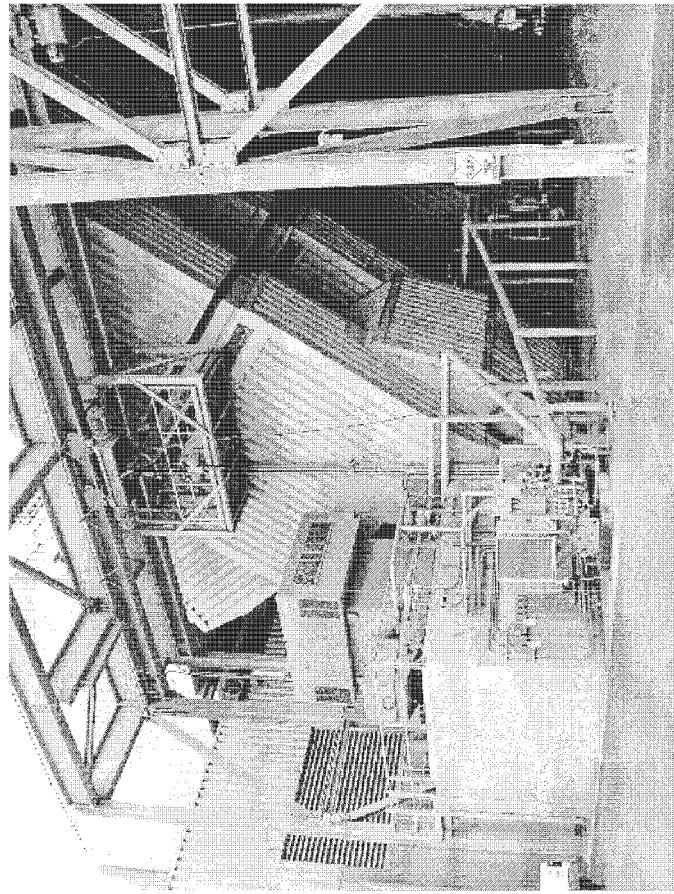
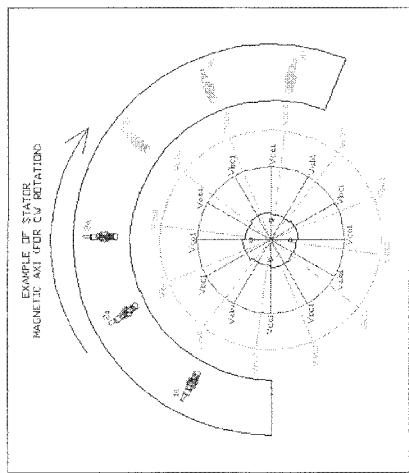
## Induced Fan Variable Speed Drives

### ID Fans Changeout Schedule:

ID Fan U2 1D 3/2004 completed

ID Fan U1 1C & 1D 3/2005 completed

ID Fan U2 1A, 1B & 1C 4/2006 scheduled

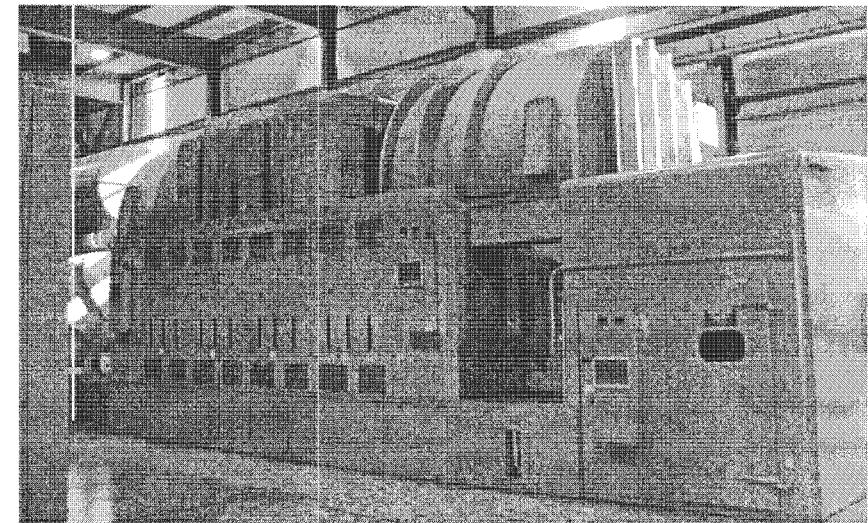


# MAJOR PROJECTS

## Generator Excitation System Replacement

U2 Gen Excitation System scheduled for replacement in 04/2006

- excitation replacement contract awarded to General Electric
- new excitation system will have some major functional differences
- existing system uses potential windings (P-Bars) that are integral to the generator windings as the power source
- new system uses external transformers that will be located on 1st floor
- existing Generex control boards are located on the north side of generator
- new control boards & circuitry will be located on the 2nd floor by gen breaker A/Cs
- requires relocation of an existing Motor Control Center



# MAJOR PROJECTS

## Circulating Water Line Repairs Unit 2



Repairing 56  
Sections (38 Last  
Year)

All in the Return  
Line

Installing  
Electrical  
Jumpers

Cathodic  
Protection  
System after the  
Outage

# MAJOR PROJECTS

## Essential Service and Station Battery Chargers

Replacing all essential service and station battery chargers.

Cannot get parts to maintain the existing system. Use spare parts to maintain Unit 1.

# MAJOR PROJECTS

## HP Heater Alternate Drain Valves

Original specification for the valve was incorrect.

Designed for 456 psi differential, over 1000 psi.

Valves were replaced a few years ago using the same specification.....oops!!

New valves and actuators suitable for the pressure drop.

# MAJOR PROJECTS

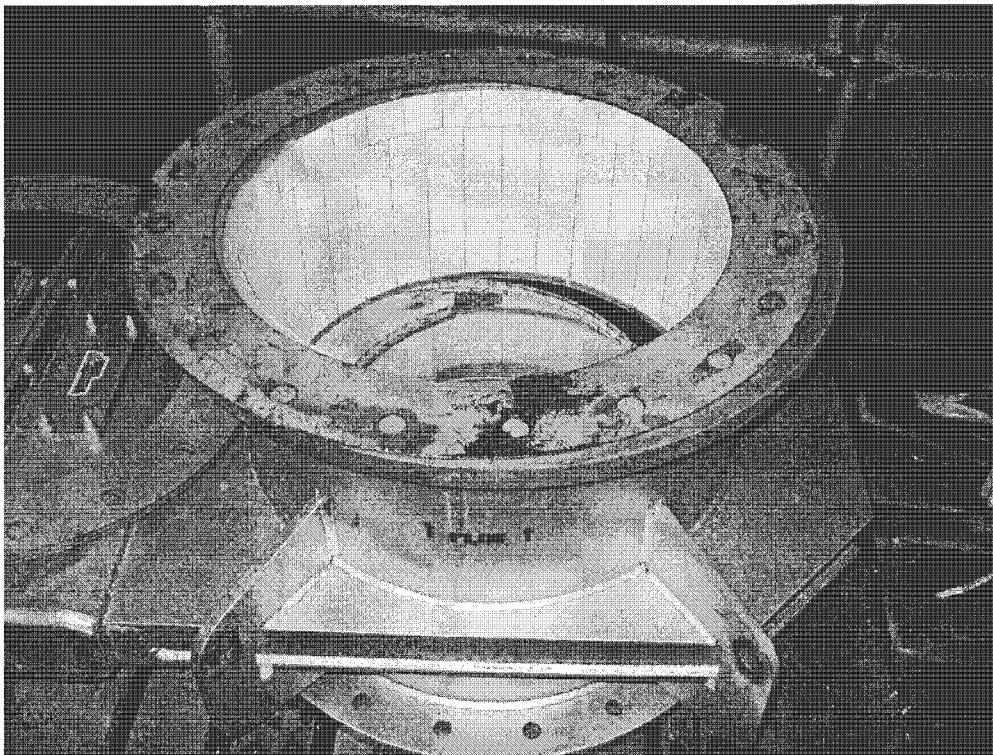
## Reverse Osmosis Unit – Water Treatment

Will be installed before the current demin trains at water treatment.

It will reduce the number of regenerations per year from 100s to less than 10.

# MAJOR PROJECTS

## Burner Line Balancing Equipment



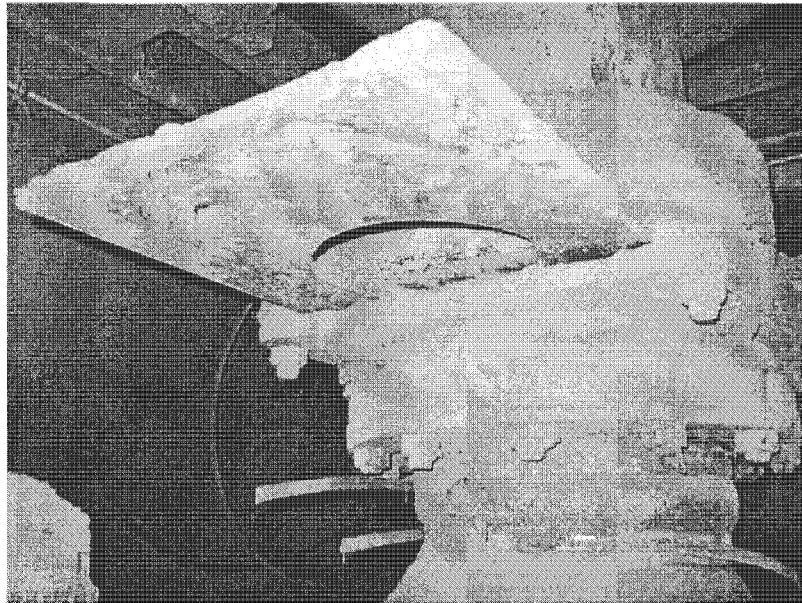
Replace restrictors installed after uprate to meet NOx requirement.

Better sealing, less coal leakage.

More easily adjust burner line balancing.

# MAJOR PROJECTS

## Sludge Conditioning Dust Control



New Conveyor Loading Chutes

Wet Dust Collector

New or Modified Flyash Valves

Seal Conveyor Openings

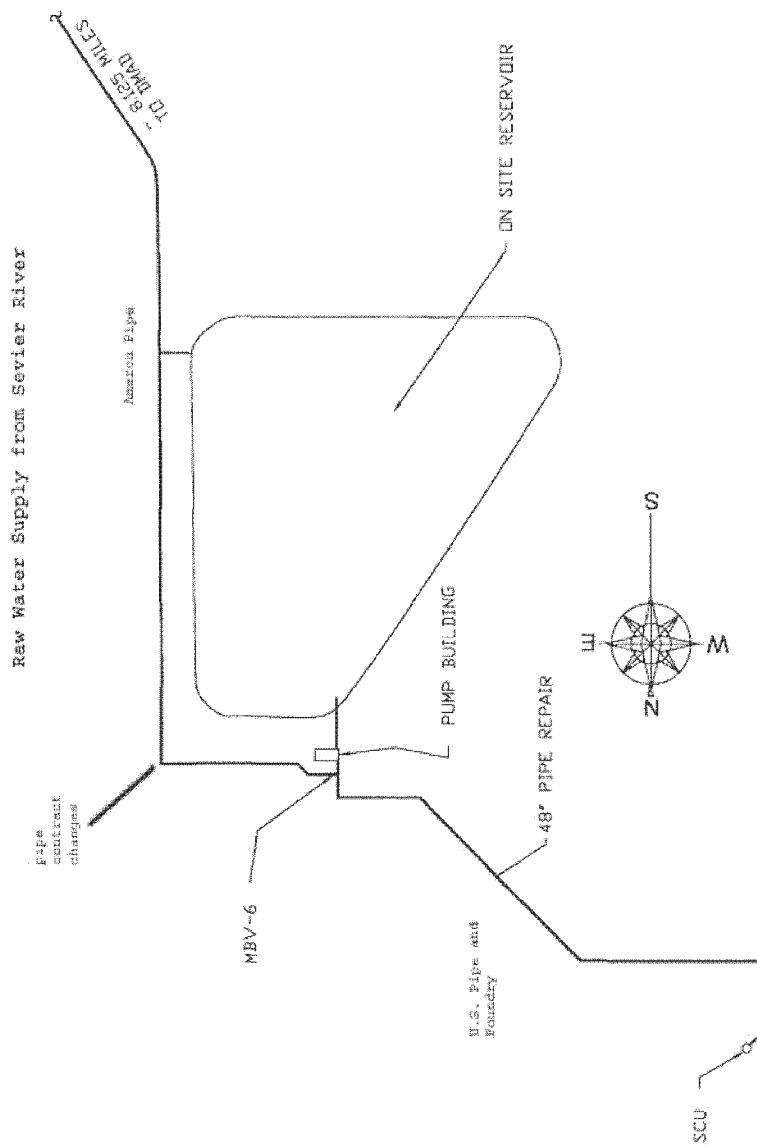
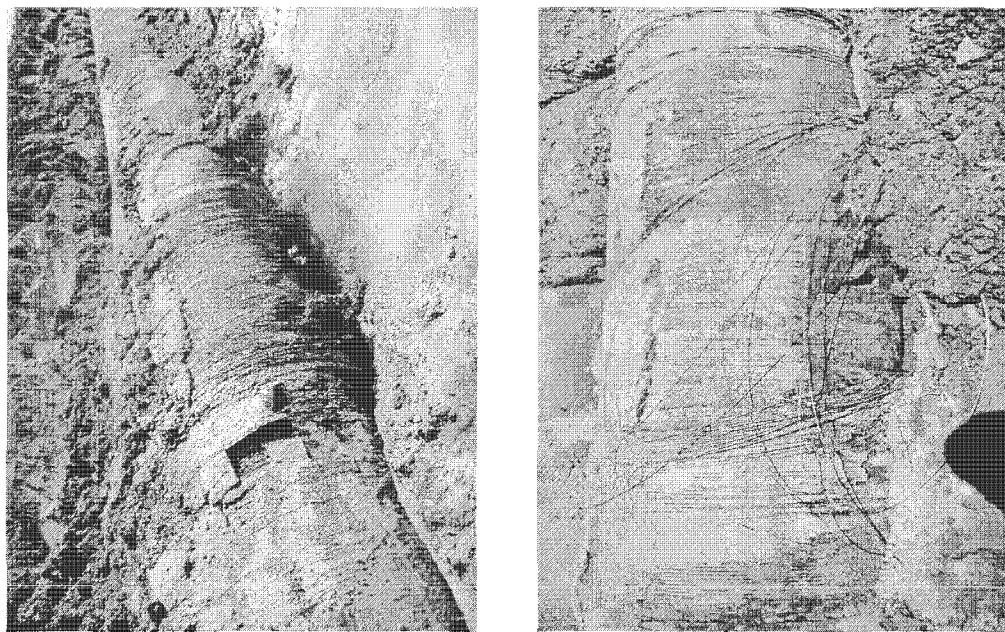
# MAJOR PROJECTS

## Fire System Pressure Maintenance System

- Replace existing 500 GPM Pressure Maintenance Pumps
  - New 1500 GPM Pumps
  - Remove 80 GPM Jockey Pumps
- Install Variable Frequency Drives to control pump speed to maintain constant system pressure.

# MAJOR PROJECTS

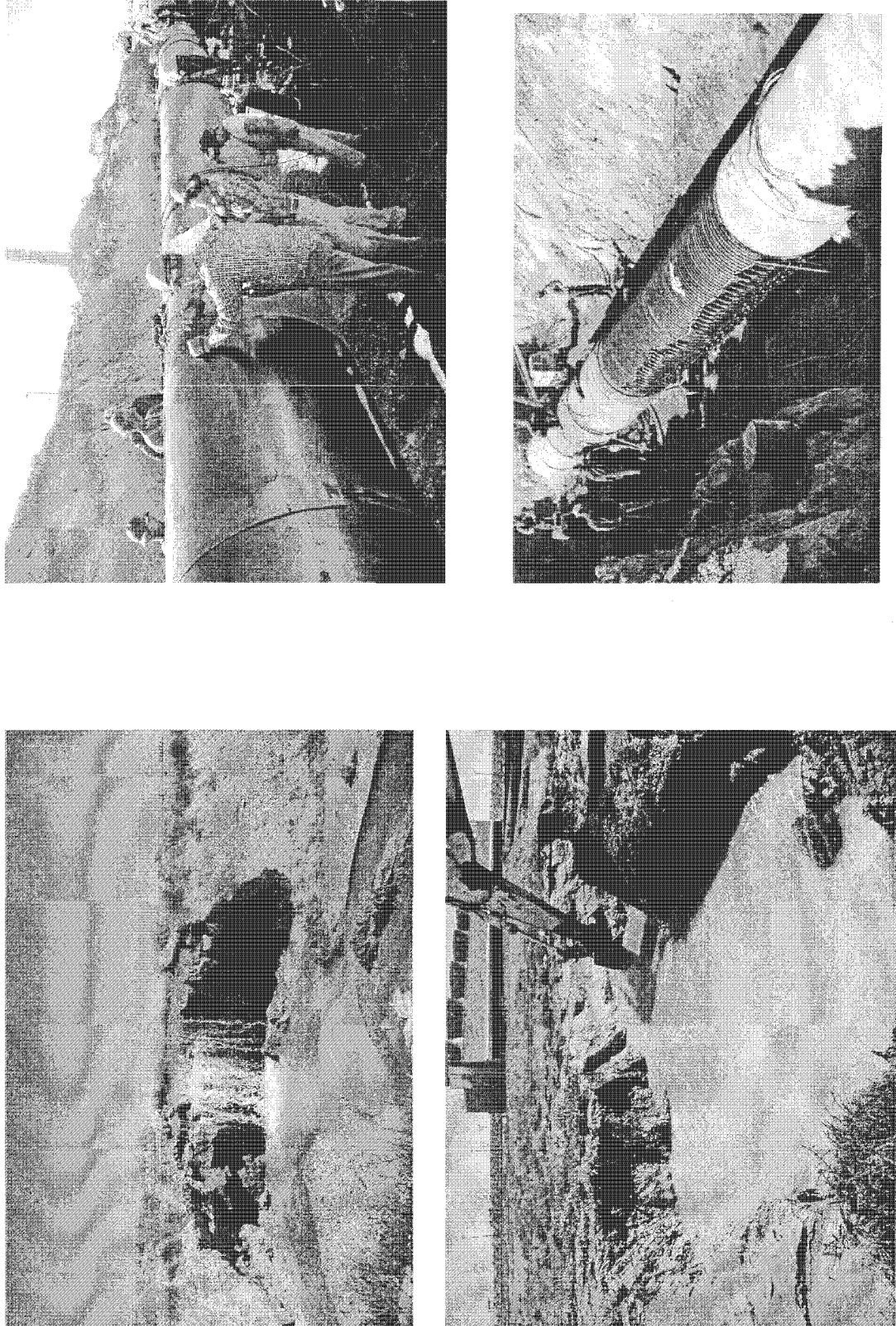
## Replace Surface Water Supply Line



IP7011509

# MAJOR PROJECTS

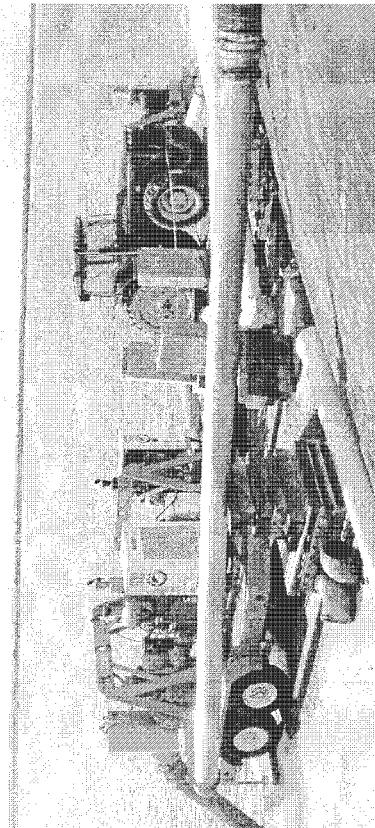
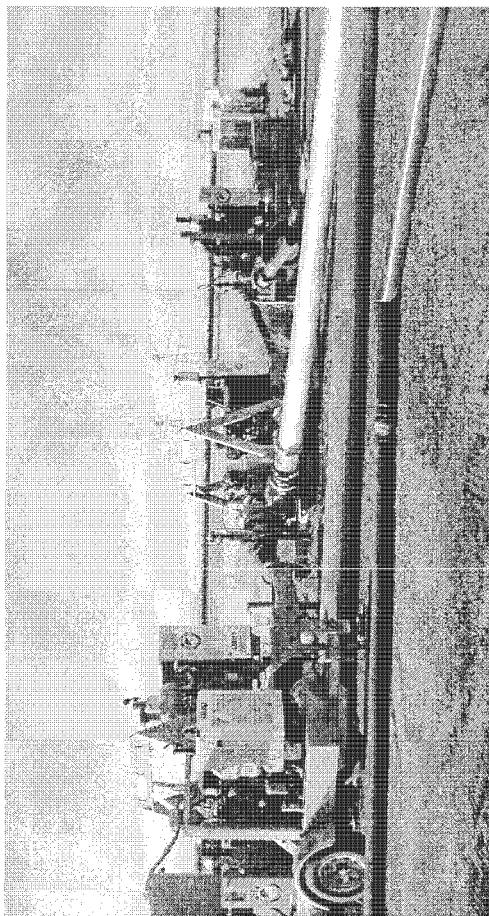
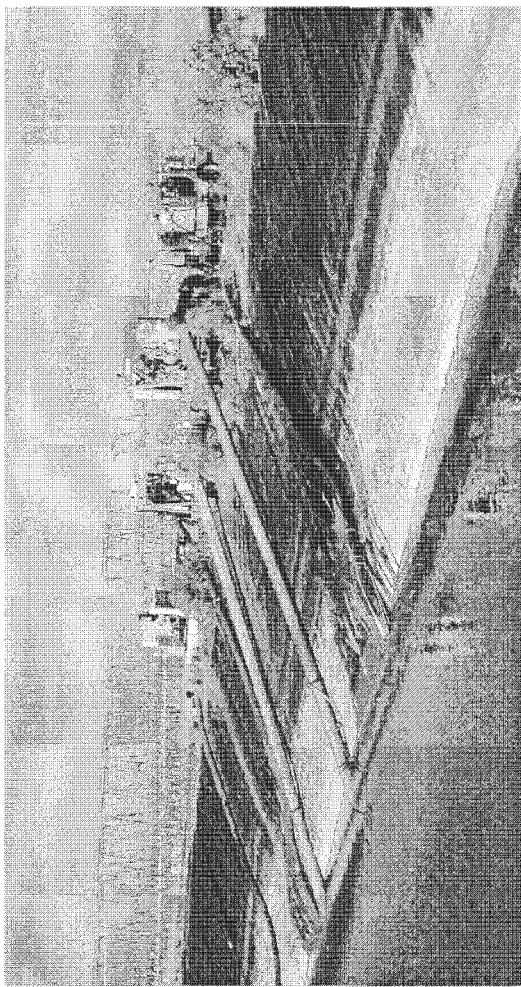
## Replace Surface Water Supply Line



IP7011510

# MAJOR PROJECTS

Circ Water Makeup- emergency makeup directly from on-site reservoir



# **Non-Capital Projects**

- **Boiler Tube Failure Reduction Program**
- **Unit 3 Coordination**
- **Sludge Conditioning Operation**
- **AWARE Program**
- **Dairy Lawsuit**
- **Sludge Conditioning Study**
- **Scrubber Sludge Marketing**
- **Special Presentations**

# Answer to Math Quiz

➤ Answer 1.618

Fabionicci's Series



1	1
1	1
2	2
3	1.5
5	1.6666667
8	1.6
13	1.625
21	1.615385
34	1.619048
55	1.617647
89	1.618182
144	1.617978
233	1.618056
377	1.618026
610	1.618037
987	1.618033
1597	1.618034

# Fabionicci's Series in Nature

- Number of petals on a flower are usually one of Fabionicci's Series
- Number of Pine cone pedals to make one revolution

# Nautilus Shell

